Distr.
GENERAL

UNCTAD/COM/66
21 September 1995

ENGLISH ONLY

UNITED NATIONS CONFERENCE ON TRADE AND DEVELOPMENT

THE RICE ECONOMY: MARKET STRUCTURE AND PROSPECTS

Study by the UNCTAD secretariat

GE.95-53283

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Abbreviations

ASEAN	Association of South-East Asian Nations
CAP	Common Agricultural Policy
CFA Franc	African Financial Community franc
ECU(s)	European Currency Unit(s)
ESCAP	Economic and Social Commission for Asia and the Pacific
FAO	Food and Agriculture Organization of the United Nations
FDI	foreign direct investment
GATT	General Agreement on Tariffs and Trade
GDP/GNP	gross domestic/national product
IATRC	International Agricultural Trade Research Consortium
IMF	International Monetary Fund
LDCs	least developed countries
UNCTAD	United Nations Conference on Trade and Development
UNDP	United Nations Development Programme
USDA	United States Department of Agriculture
WTO	World Trade Organization

SUMMARY AND CONCLUSIONS

1. The rice economy is sharply skewed. Rice cultivation has provided the bulk of agricultural output and employment in most developing economies in Asia, by far the largest grower of this staple foodgrain. Surplus production comes from a handful of countries, again mostly located in Asia, while the sources of import demand are numerous and spread across the world. Rice exports are marginal relative to global output.

2. Trade liberalization under the Uruguay Round Agreements is expected in the near to medium term to have only a modest impact on the prices of rice or, for that matter, of competing agricultural products. This factor and the structural "thinness" of the world rice market mean, by and large, inherent price volatility in the short term and continuing decline in real prices over time.

3. The new, relatively large access to East Asian markets secured under the Round could be highly significant in the long run. Its impact on the rice economy, meanwhile, tends to be outweighed by such more mundane factors as unexpected output variations due to weather conditions, population growth and urbanization patterns, economic expansion and restructuring, and ongoing improvements in policy incentives and support infrastructure.

4. In particular, income growth will generate demand shifts in favour of better quality (e.g. fragrant varieties) and grades of rice, and this will present significant export opportunities. The daily diet will also have greater contents of meat, fish, fruit and diary produce. But economic expansion will constrain rice supplies and availability due to competing, and often more remunerative, demands for farm labour and grain land from other productive sectors and other agricultural activities as well. This trend will be compounded by sizable increases in the utilization of rice as inputs, notably feedgrains. All these interactions, especially from such large economies as China and India, could have a very large impact on the international cereal market in the longer term.

5. There is generally limited scope for more extensive cultivation of rice in Asia, a continent already heavily populated. More intensive farming would require massive investment in complementary infrastructure and extension services, including another bio-engineering-based green revolution. This is because the first one has spread to the most progressive, adaptable, and reachable segments of the farming population in the major producing economies. On the other hand, productivity growth associated with the earlier revolution has slowed down or stagnated, not least because of the declining resources base.

6. Another equally important issue is the eroding comparative advantage of agriculture, including rice farming, as economies grow and change structurally. The search for less costly as well as more workable and sustainable modalities for assistance on distributive grounds will present another major challenge to policy management in the years to come.

INTRODUCTION

7. The present study forms part of a larger ongoing effort within the Commodities Division of UNCTAD to monitor and assess pertinent, emerging trends in the production and trade of primary products, both agricultural and mineral. Its focus is on changes of a structural nature within the rice economy. This is not motivated solely by the hastened process of expanding globalization which can be expected under the recently concluded Uruguay Round Agreements. For at least a decade and a half, there has been a spreading movement toward strategic reorientation of development policy, as well as economic policy liberalization among countries of all shades of ideology. Such basic adjustments and reforms are designed to promote domestic economic efficiency and resilience, structural diversification and external competitiveness, as well as their sustainability over time.

8. The evolving and cumulatively self-reinforcing processes of domestic deregulation and competitive internationalization, in turn, have led to increasingly complex patterns of economic interaction, both within and outside the commodity economy, including the rice sector. This characterizes the interactive relationships between national development strategies and socio-economic priorities, and the competitive strategies of individual firms and producers at the micro-level. Also affected are a series of convergent and competitive actions associated with, among others, agricultural trade, investment and other factor movements between the developed and developing countries, as well as among the latter themselves.

9. As regards the global rice economy, the need for productivity-enhancing structural adjustments and diversification among nations has become even more pressing to meet, if not to take full advantage of, the emerging challenges of deepened interdependence. This necessitates, in turn and among other courses of action, concerted government efforts to upgrade the quality and range of domestic human resources and technological capabilities. Equally important, on the other hand, is the judicious provision of an increasingly diversified stock of social, economic and institutional infrastructure; this is indispensable for the nurturing, harnessing and unleashing of the creative forces of private enterprise and entrepreneurship in the production and trade of primary products, including rice.

10. The paper is in five chapters. Salient structural features of rice production and trade are examined first.[1] The next three chapters are concerned respectively with the short-term and secular movements in global rice prices (chapter II), as well as with major factors affecting demand variables (chapter III) and supply responses (chapter IV). Due attention is given to the expected impact of the Uruguay Round Agreements and of evolving changes and shifts in demand and supplies on the domestic and external rice economy. The potential of rice as an export commodity is also examined against the above backdrop. Chapter V presents a number of broader development perspectives relating to the rice economy.

Chapter I

STRUCTURAL CHARACTERISTICS OF THE RICE ECONOMY

11. Rice has long been the staple food item, as well as a major source of calorie intake, for about one-half of the world's population. The overwhelming bulk of this commodity (about 96 per cent in 1993) is produced in developing economies, which also account for some 50-60 per cent of global output of wheat, another basic cereal of ancient origin. Rice has been grown on a large scale in Asia since pre-historical times (see box 1). Indeed, in many parts of the continent, rice farming has taken on a special significance which is larger than the intrinsic value of rice as a necessity for subsistence. Among other socio-organizational and economic implications, this accounts for the deep-seated cultural attachment to rice cropping as an age-old, time-honoured and independent way of life in a sustainable partnership with the good earth and rhythm of nature.[2]

A. Production

12. Global paddy crops are estimated to have averaged some 528 million tons per year during the period 1993-1994; at the standard conversion ratio, this figure is equivalent to around 348 million tons of milled rice. Large growers with an annual domestic output in excess of one per cent of this aggregate level are all located in Asia - except Brazil and the United States of America. In particular, paddy harvested from developing Asian economies on average contributed almost 89 per cent of world supplies in the same period. By far the largest producers are China and India, which in 1993-1994 registered an average annual output of around 177 million tons and almost 118 million tons of paddy respectively; these were equivalent to just over one-third and about 22 per cent of the global volume. Paddy output from Myanmar, Thailand and Viet Nam was only in the range of three to five per cent of world supplies in the same years (figure 1).

13. Both the levels of productivity and their rates of change over time differ noticeably among rice-producing countries. Such diversity reflects the uneven spread of the green revolution; on the other hand, there are varying scales and intensities of cultivation, as well as availability of crucial infrastructure and support services. Farm sizes in many Asian economies, for example, cluster around one hectare, not all of which is available for wet-rice cultivation. This is due not just to the high levels of population density relative to the amount of arable land. For a number of historical and institutional reasons as well, there has not been any widespread tendency towards consolidation of land holdings in most of the economies; this would permit a large-scale application of the mechanical technology but would also lead to a polarization of densely populated rural societies into managerial farms and landless labourers (Bray, 1989, pp. 115-117; and Phillips, Winton and Mai, 1994, pp. 237-238).

14. Generally, yields in Africa averaged some two tons per hectare during 1992-1993, a rise of less than one-fifth over the levels prevailing a decade ago. Productivity in Asian rice farms tends to be higher, around 3.6 tons a hectare in the early 1990s; this also represented an increase of some one-third over the standards achieved a decade earlier. China, the Republic of Korea and Taiwan

Province of China are among Asian economies which have consistently achieved rice yields (around 5.8 to 6 tons a hectare) approaching the levels realized in developed countries; these range from 6.2 tons in Japan and the United States to as high as just over 8 tons in Australia. It should also be noted that certain varieties of rice produce 20-30 per cent less than the quantities harvestable from their hybridized "miracle" counterparts. Output from the former plants, however, is highly valued for its superior flavour, texture, taste and cooking characteristics.

Box 1

Domesticated rice in Asia a/

The earliest archaeological evidence of such a cereal plant (Oryza sativa) was discovered at the site of Hemudu village in Zhejiang province within China's Yangzi delta. The most ancient stratum at this location has been carbon-dated to about 5000 years B.C. More generally, many centres of rice cultivation were located in the fourth millennium B.C. within the piedmont zone of Assam (India), upper Myanmar and Thailand, south-west China and northern Viet Nam.

The varieties of domesticated rice are very large in number. Indica and Japonica rice are the two commonly farmed sub-species; both of them encompass glutinous and non-glutinous varieties. The former tends to have longer, more slender grains which usually remain separate when cooked. The latter variety is shorter, stouter and becomes translucent and more sticky with boiling. There are, however, other types of rice which do not fit into the above categorization; a third sub-group of Javanica rice is thus designated to refer to some varieties from Indonesia.

Rice is by nature a swamp plant grown in standing water; for all practical purposes, global output is from the wet-rice variety. Fast growing, floating rice plants are cultivated where there is regular flooding. Dry or hill rice normally does not thrive in wet fields. Hill rice is thus associated with shifting cultivation and does not often provide a suitable base for the development of increasingly complex technical systems and related socio-economic organizations.

Provided that water supply is adequate, rice plants are relatively high-yielding and can be cropped up to three times a year. Average productivity worldwide stood at almost 3.6 tons of paddy per hectare compared to just over 2.5 tons of wheat in 1993. There is also a much higher yield to seed ratio; a single seed can replicate as many as 2,000 times in transplanted rice plants. All these characteristics contribute to high land productivity and less cropping risk. But rice cultivation requires heavy labour inputs, thus necessitating and permitting demographic increases and concentration.

Research had been done in Japan to produce improved rice varieties through cross-breeding of the best local Japonica plants as early as the 1870s. In China, breeding programmes were set up at various Universities in 1925. The International Rice Research Institute, founded in 1960, was thus able to select the best available strains from many countries for its pioneering work.

The chief characteristics of the early heavy-yield varieties are their short gestation period, pronounced response to chemical fertilizers, and heavy productivity. Among the shortcomings include a lack of flavour, insufficient adaptability to local conditions and uneven water availability, and high vulnerability to diseases and pest infestations (especially when associated with or introduced as a packaged monoculture practice). There have been great improvements since the mid 1960s, and the IR36 (a progeny of 13 different varieties from six nations) is now cultivated on more than 10 million hectares. With good irrigation, three crops can be harvested within one year.

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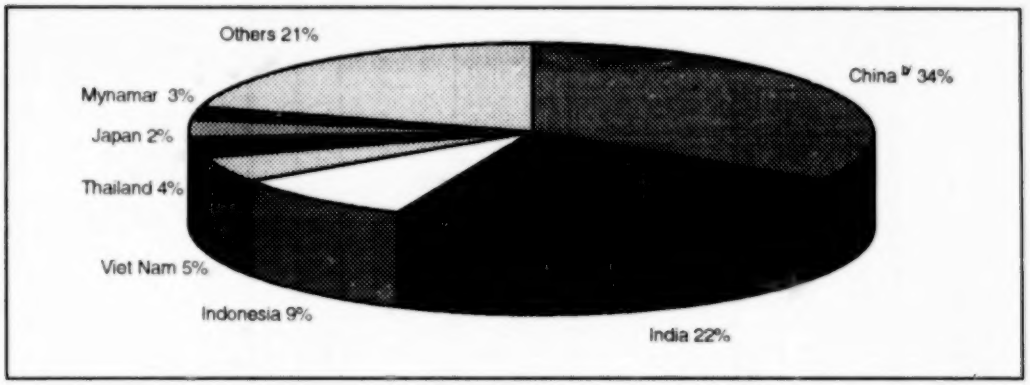
a/ Based largely on Bray (1989, pp. 8-26).

Figure 1

Relative shares of the world's largest rice producers, 1993-1994 a/
(Annual averages in percentages)



Source: Food and Agriculture Organization of the United Nations (1994g, p. 13).

a/ Data for 1994 are preliminary estimates only.
b/ Including Taiwan Province of China.

15. With few exceptions, the cultivation of cereals and other staple crops accounts in general for the large bulk of land and other utilized inputs, of employment, and of output within the primary sector; primary activities, in turn, dominate domestic production in most third world countries. Rice farming has long been a significant source of subsistence and/or income for a substantial number of farmers - particularly in many developing economies where this commodity is a traditional food crop and where alternative cash-earning opportunities are typically rather limited.

16. In terms of the work-age population in the early 1990s, for example, the economically active labour force in agriculture ranged from around one-half to as much as two-thirds in many economies with rice as a predominant staple; these economies included China, India, Indonesia, Myanmar, the Philippines, Thailand and Viet Nam in Asia, as well as most of those in the African rice belt. As a whole, some 1.1 billion people depend directly on farming for their livelihood, while the agricultural sector population represents over 2.3 billion persons in developing countries (table 1). These figures contrast sharply with a work force and farm sector population of less than 15 and 30 million respectively among countries of the Organization for Economic Cooperation and Development (OECD).

17. Rice production and trade thus provide an important means to alleviate rural poverty, as well as to help improve distributive equity among domestic regions. Although estimates are rather variable, orders of magnitude are reasonably clear: there were about 1.1 billion poor people in developing countries in 1985; of this number, some 0.8 billion were found in Asia. Notably, the rural poor accounted for as much as two-thirds of the overall incidence of poverty in many economies across various global regions (United Nations Development Programme (UNDP), 1994, pp. 164-165 and 210).

Table 1

Agricultural sector population and work force in selected developing countries and regions, 1980 and 1993

	Agricultural sector population				Agricultural sector work force			
	Number (mil.)		% of total population		Number (mil.)		% of total work force	
	1980	1993	1980	1993	1980	1993	1980	1993
Asia (total) a/	1625.8	1°27.1	66	58	753.7	877.2	69	60
- Bangladesh	66.0	81.3	75	66	18.9	25.0	75	66
- China	739.5	785.9	74	63	406.1	463.1	74	65
- India	456.0	553.3	66	62	185.0	223.9	70	65
- Indonesia	80.2	81.4	53	42	32.2	35.7	57	46
- Pakistan	49.3	65.9	58	51	13.9	18.4	55	48
Africa (total)	308.4	407.2	69	62	128.7	158.8	71	64
- Egypt	18.7	21.9	46	39	5.1	6.1	46	39
- Ethiopia	30.9	39.8	80	73	14.1	16.2	80	73
- Nigeria	53.4	76.0	68	64	21.8	28.2	68	64
Latin America (total)	114.6	115.3	32	25	38.9	40.9	32	24
- Brazil	37.8	35.4	31	23	13.8	13.2	31	23
- Colombia	9.1	8.7	34	26	2.7	2.9	34	25
- Mexico	24.5	25.3	37	28	7.9	9.0	37	28
Regional total	2048.8	2349.6	63	55	921.3	1076.9	66	58
World total	2196.0	2445.5	49	44	993.1	1123.1	51	45

Source: FAO (1994a, pp. 19-35).

a/ Including Middle Eastern countries.

18. There are also stark disparities among the poor themselves. Malnourished persons numbered as high as 0.86 billion (or 36 per cent of the total population) in 89 developing countries (excluding China) during the mid 1980s; they formed a larger proportion of the people in sub-Saharan Africa and South Asia than elsewhere within the third world. Furthermore, disadvantaged social groups (such as women, children, the aged, etc.) tend to bear a heavier burden arising from poverty and malnutrition, as well as from various phases of policy transition and structural adjustment.[3]

B. Trade

19. World rice exports in 1993-1994 were expected to average 15 million tons annually. This is less than five per cent of aggregate output (compared to some 20 per cent in the case of wheat), and thus the global market is "thin" and can be highly volatile. Only five producers managed to sustain an average export volume greater than one million tons during the above period - namely (in order of relative importance) Thailand, the United States, Viet Nam, China and Pakistan (figure 2). Together, these countries accounted for 78 per cent of global rice exports.

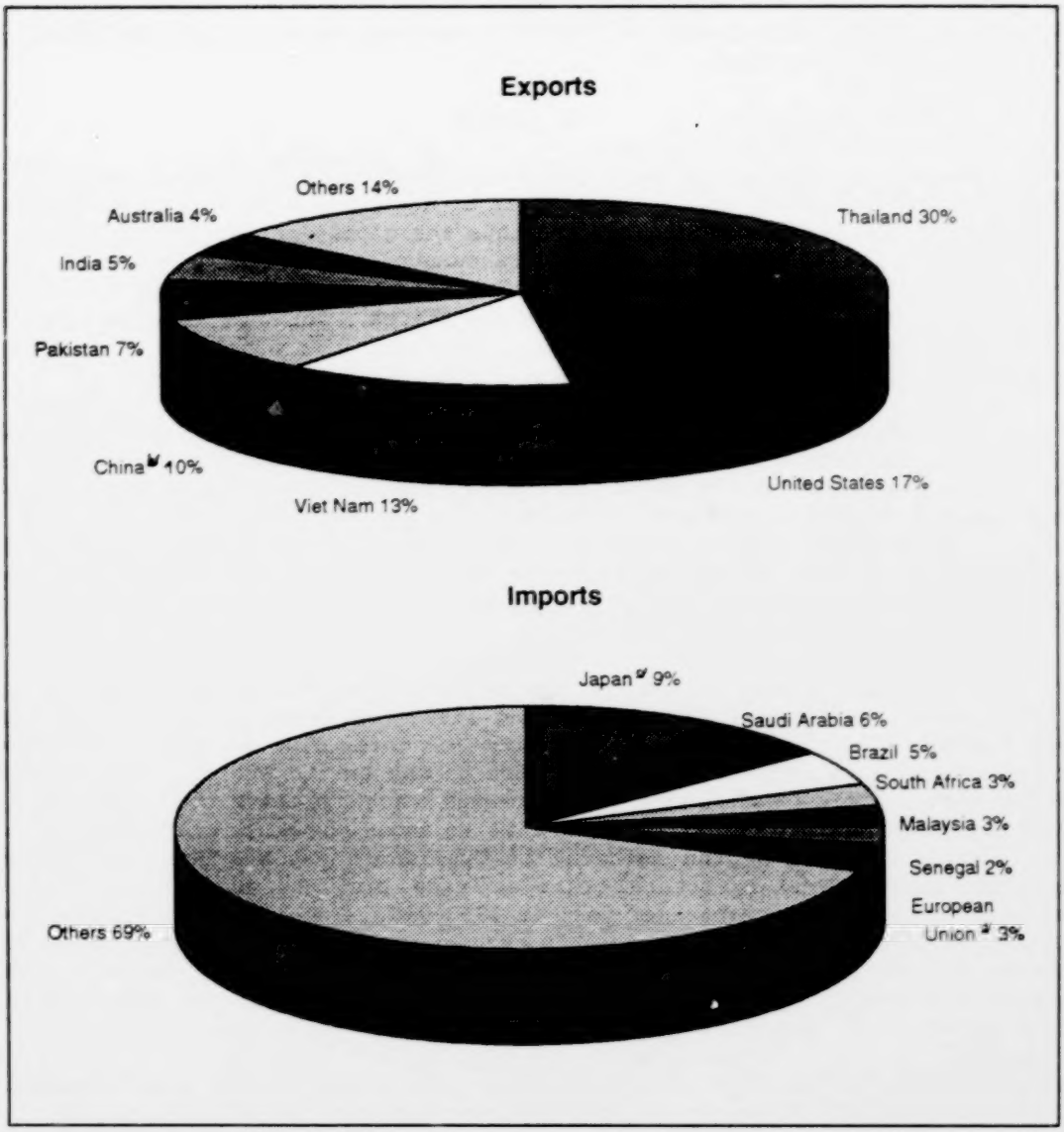
20. The amount of exportable surplus relative to production varies greatly among them, however. Over 1993-1994, for example, the export/output ratios were minuscule among the traditional rice-consuming countries such as China and Viet Nam (each around 1.2 per cent), Myanmar (2.6 per cent) and Thailand (3.6 per cent). In contrast, the corresponding ratios averaged 27 per cent for Pakistan and reached as high as one-half in the case of the United States, two major exporting countries where rice is a secondary or only an insignificant foodgrain in terms of overall cereal consumption.

21. Rice exports have brought in large amounts of foreign exchange for many rice-surplus producers. Globally during 1992-1993, such trade was worth some US$ 4.4 billion annually; about 65 per cent of this value accrued to developing country exporters and another 18 per cent to the United States. The relative importance of rice as a source of foreign exchange earnings, however, has declined considerably or has remained limited among the major surplus countries. This cereal used to be the mainstay of Thailand's exports but, due to rapid economic growth and structural change, rice provided only 4 per cent of merchandise export receipts per year in 1992-1993 (International Monetary Fund (IMF), 1994, p. 578). The most notable exceptions to the generalized observation above include Myanmar and Viet Nam: rice exports constitute a major source of domestic savings (in the form of foreign exchange) in these two countries which have recently re-emerged with significant tradable surpluses.

22. A large proportion of rice exports take place within the framework of Government-to-Government or officially sanctioned contracts, involving as a rule concessional terms and conditions. Rice also features with considerable importance in food aid shipments, with cereals averaging altogether just over one million tons during 1992-1993. At the same time, there have been changes in dietary habits, voluntarily or due to forced circumstances. The factors involved include rising affluence, increasing urbanization, supply disruptions due to bad weather or civil strife, and excess demand pressures from population growth. They have combined to account in part for the relatively large and increasing volumes of imported rice, particularly in many developing economies where this cereal is by and large not the main traditional staple (figure 2).

Figure 2

Relative shares of the world's largest rice exporters and importers, 1993-1994 a/
(Annual averages in percentages)



Source: FAO (1994q, p. 14-15).

a/ Data for 1994 are preliminary estimates only.
b/ Including Taiwan Province of China.
c/ An estimated 2.4 million tons of rice were imported in 1994 due to an exceptionally bad harvest in the previous year.
d/ Excluding intra-Union trade.

23. Rice imports, for example, have risen steadily over the past decade to average some 3.4 million tons (or almost 23 per cent of the global level) in Africa in 1993-1994; the corresponding figures were 0.8 million tons (or 10 per cent) in 1971-1972 and 2.3 million tons (or 22 per cent) 10 years later. These trends reflect the combined influence of supply shortfalls and relatively high rates of natural population growth in Africa. These population growth rates have been in the range of 2.6 - 2.8 per cent among both sub-Saharan and least developed countries (LDCs) in the past three decades, compared to 2.2 per cent for the third world as a whole. As a consequence, the per capita food production index averaged 94 points during 1992-1993, compared to almost 103 in 1977-1978.

24. The inflow of foreign-sourced rice has also been on a steady upward trend in the United States, a substantial rice exporter, and within the European Union, a largely self-sufficient rice producing area. Such imports reflect the substitution of superior or preferred varieties made possible by high disposable real earnings among the rice-consuming population there; moreover the levels of per capita rice consumption overall are low in these countries (more in chapter III).

25. In contrast, the normal volume of imported rice has declined over the years among developing Asian economies. This trend is attributable to varying degrees of increasing self-sufficiency in foodgrains in countries with previously large deficits (e.g. Bangladesh, India, Indonesia, the Philippines and Viet Nam). On the other hand, there has apparently been a stabilization of rice demand and consumption in many traditional, large importers where real income has continued to expand rapidly (e.g. Hong Kong, Malaysia and Singapore). Thus, despite rising population, rice imports within Asia averaged 2.2 million tons or (15 per cent of the world level) a year in 1992-1993, compared to 4.9 million tons during the 1970s and 4.3 million tons in the ensuing decade.

26. As a whole, the large bulk of global rice production is still strongly vulnerable to the vagaries of weather conditions. Only a few countries manage to have a large exportable surplus, and the amount of commercially traded rice is marginal relative to world output. Such "thinness" has endowed the rice market with an inherent price volatility. Other factors impinging on rice demand and supply, and hence prices, include shifts in consumer preferences as a result of income growth and spreading affluence, ongoing policy reforms to enhance production efficiency and flexibility, and the implementation of the Uruguay Round Agreements from 1995. All these matters will be considered in some detail in the next three chapters.

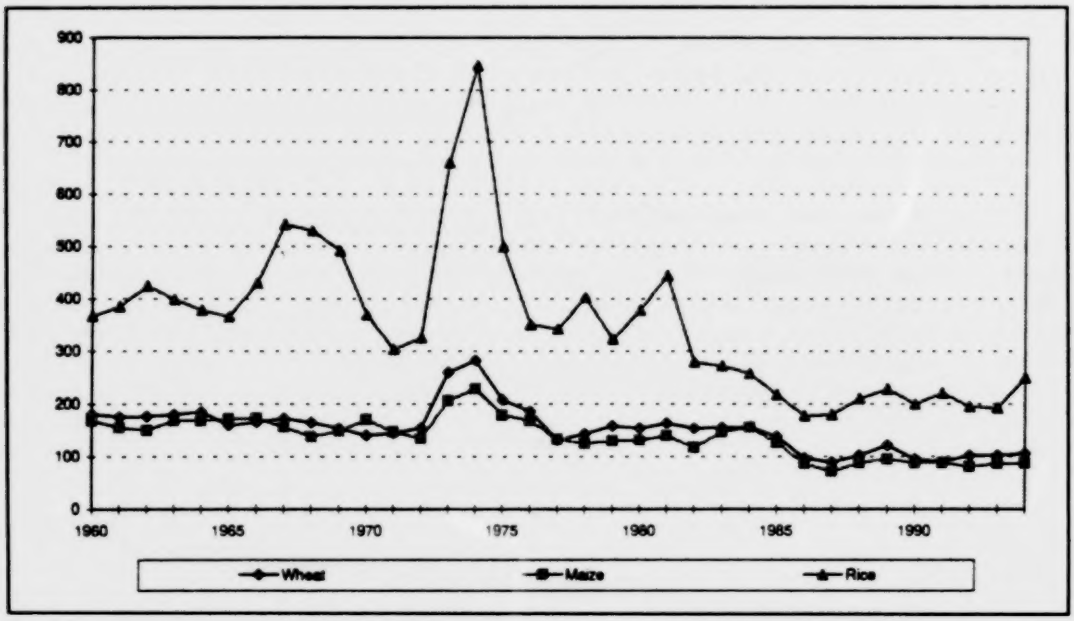
Chapter II

PRICE MOVEMENTS AND TRENDS

27. Staple food items generally serve as a basic wage good in urban areas of most developing economies; indeed, subsistence foodstuffs can absorb as much as one-half of the urban poor's household budget. The need to ensure relative stability in food prices, as well as domestic food security, thus constitutes an important policy objective of great political sensitivity. In the case of rice, however, there has been marked volatility in internationally traded prices, particularly during periods of production shortfalls. Such instability was exceptionally pronounced in the late 1960s and during a large part of the following decade; it has been more moderate from the 1980s due mostly to the improved supply situation (figure 3).

Figure 3

Yearly variations in the free market prices of rice, wheat and maize, 1960-1994 (In constant 1985 dollars)



Source: UNCTAD secretariat calculations.

A. Historical patterns

28. As a proxy for transient instability along the trend line, the coefficient of percentage variation during 1968-1978 was almost 37 for annual rice prices (in constant US dollars), compared to 29 for wheat and 19 for maize. On the other hand, the corresponding instability coefficients for production reached only around 2.8 for rice, and 5.1 and 4.4 in the case of wheat and maize respectively (World Bank, 1986a, pp. 22-23); the great sensitivity of rice prices relative to even marginal changes in output is thus evident. During the decade ending in 1993, however, variations in nominal rice prices moderated considerably, with the coefficient being about 11.6, compared to 10.9 for food items and 8.4 for all foodstuffs and beverages (UNCTAD, 1994a, p. 416).

29. Generally, the sharp fluctuations in external rice prices are attributable to a number of structural conditions. There is the marginal amount of exportable surpluses relative to production (less than five per cent in recent years, as noted earlier) and the still smaller volume available for commercial trade in international markets (due to the prevalence of Government-to-Government sales, as also mentioned previously). In addition, world rice stocks relative to total use averaged 15 per cent (compared to 24 per cent in the case of wheat) during 1992/94; they have thus fallen by over one-fourth from the levels held in the late 1970s. Concerted efforts to stabilize or to limit the upward spiral in domestic rice prices through bulky external sourcing would thus aggravate further external price volatility in times of global shortage.[4]

30. Apart from this structural instability in the prices of many primary products, including rice, the level of such prices over the long term is another issue of significant concern for commodity producers, among others. The available evidence is reasonably clear that non-oil commodity prices in real terms have been on a declining path; the fall was particularly steep for food, tropical beverages, and vegetable oilseeds and oils over the 1980s. A related issue is that primary commodities have also experienced generally unfavourable (net barter) terms of trade *vis-à-vis* manufactures over the years (Maizels, 1992, pp. 7-20; and 1994, pp. 1686-1687; and Sapsford and Balasubramanyam, 1994, pp. 1737-1741).

31. Nominal prices of rice or, for that matter, most other primary products inflated significantly during the commodity booms of the 1970s. In terms of current (United States) dollars, the increases averaged some 10.3 per cent annually compared to 8.7 per cent for food items as a whole. Translated against the United Nations index of export unit values of manufacture goods from the industrialized market economies, however, there was an annual decline averaging 0.7 per cent for the decade.

32. Commodity prices collapsed and remained at low levels from the early 1980s. In particular, nominal unit values for rice were falling by 4.9 per cent a year during the 1980s, and by 3.3 per cent over the period 1990-1993. Notwithstanding considerable improvements in quality, the terms of exchange between primary and manufactured products have become even more unfavourable. The real prices of rice were declining annually by 8.1 and 5.2 per cent respectively over the above periods. The consequent losses in comparative purchasing power must have been offset to a considerable extent by productivity gains within the rice economy; nevertheless, the amount of real income foregone is sizeable by any standard.

B. Short to medium-term outlook

33. There are considerable uncertainties concerning the process of rice price formation in the future. Apart from unpredictable climatic conditions, there will be major changes and shifts in demand and supply schedules toward better quality and grades of rice (box 2), as in other food items, as a result of income growth, structural change, policy reforms, and the application of yet a new wave of agricultural technologies. Moreover, the new multilateral regime on farm production and trade is expected to have an appreciable impact on the global commodity economy, including that of rice, and on the domestic policy-making environment as well.

Box 2

Rice and grains

The quality of this cereal is normally measured in terms of the proportion of broken grains. Higher-grade rice has fewer than 10 per cent of such grains, but this commodity may be traded with 50 per cent broken grains; in this case the texture may not be uniform due to the likely mixture of broken grains from different varieties.

Indica and Japonica rice are the two main varieties produced and traded internationally. The former has a longer grain, at least six millimetres, and has a length to width ratio in excess of three. The latter may be 5.2 millimetres or longer but with a length/width of less than three. Aromatic varieties such as Basmati rice from India and Pakistan and Jasmine rice from Thailand are long-grained. They command a high premium in world markets. In the early 1990s, for example, the prices of Basmati rice from Pakistan were on average 60 per cent higher than those of Thai rice, 100 per cent (unbroken) grade; the ratio tends to be much higher in periods of strong demand (FAO, 1994g, p. 16).

Several varieties of glutinous rice are consumed as a daily staple and as desserts in a wide range of preparations in many countries. They are traded internationally in very small quantities, however.

The large bulk of domestic output in North-East Asia (Japan, the Republic of Korea and Taiwan Province of China), Australia and the European Union is of the short-grain, Japonica rice. Generally, Indica varieties dominate the rice crops in the rest of Asia, as well as in many other producing countries. In the United States, a major rice exporter, Japonica rice varieties constitute around 30 per cent of internal output. An estimated 87 per cent of global exports in the early 1990s were long-grain rice (Phillips, Winton and Mai, 1994, pp. 236-237).

There are normally two major rice processing stages. Rough or paddy rice can be milled into brown rice by removing the husk (husked rice); white rice is obtained through the removal of the rice germ and several bran layers, as well as through the necessary polishing (pearling). Some rice is parboiled before milling to help retain most of the nutrients and vitamins lost by white rice. The process involves vacuum-extraction of air between the husk and kernel, and pressurized steam heating to force and secure these nutrients and vitamins on the grain. The rice so treated is then dried and milled.

In many countries, imported white rice tends to be subject to an appreciable degree of tariff escalation.

1. Level and magnitude

34. Most estimates indicate some increases in world rice prices as a result of trade liberalization measures implemented under the Uruguay Round Agreements. In general, the postulated price updrift is attributable to several self-reinforcing factors. Firstly, there is a (double-impact) reduction in government support for both production and exports, and this will raise the costs of output, as well as export prices. Secondly, minimum and current access concessions will enlarge rice demand and hence exports, including those destined for Japan and the Republic of Korea. Thirdly, there may be extra demand as a result of higher local production expenses, lower import duties and/or a more liberal trade regime in rice importing countries.

35. The estimated increases in rice prices, however, vary widely from over 18 per cent to around one per cent (table 2). This is a reflection of several tenuous assumptions made in the absence of firmer or more assured information on the interactive behaviour of supply and demand variables in various postulated scenarios of national policy adjustments. At the same time, the complex and dynamic responses induced by these adjustments in various economic strata (e.g. macro, sectoral and micro levels) and among various groups of economies do not lend themselves to unqualified approximations.

36. In general, the Uruguay Round Agreements are widely expected to have only a limited or marginal impact on rice prices in terms of identifiable movements in both magnitude and rate of change, at least in the near to medium time frame. Firstly, the full outcome of current trade liberalization measures will be totally in place only after a relatively long phase-in period of 6 to 10 years. Besides, the base period of 1986-1988 for tariffication is one of low commodity prices and high levels of protection in developed countries, compared to those prevailing in more recent years. Procedures and modalities for the implementation of binding commitments meanwhile are not without ambiguities; these include provisions concerning tariffication, reductions in total aggregate measures of support for production or in subsidized export expenditure and volume, etc. The incidence of inaccurate conversion (on the high side) of non-tariff barriers into tariffs and of unbound tariff rates into tariff ceilings can thus not be excluded.[5]

37. Secondly, the current rules represent an important, but at most modest, first step forward in the long and involved process of agricultural trade liberalization. This is apparent when various safeguards, guarantees and accommodations are taken into account; pertinent in this connection are provisions as regards within-quota and above-quota duties, and volume and value trigger levels in the case of import surges. There is, thirdly, a set of "extenuating" factors which may culminate in "business as usual" in rice trade. Two important developed-country exporters of rice, Australia and the United States, have had low protection for this farm subsector. On the other hand, a concerted effort at agricultural reform adopted by the European Union has in effect put the Common Agricultural Policy (CAP) on a fundamentally new basis since 1993, especially in the area of cropping. Thus, although tariff protection for local producers remains comparatively heavy, it is not much at variance with the levels prevailing in the Union during 1994. In addition, reductions in rice export subsidies in 1995 are expected to be marginal - ranging from 5 to 6 per cent of the outlays and volume in the base period (International Agricultural Trade Research Consortium (IATRC), 1994, pp. 47-48).

Table 2

Estimated changes in world prices for selected cereals
(In percentages)

	Rice	Wheat	Coarse grains
A. From Uruguay Round trade liberalization a/			
Tyers and Anderson (1986) b/	7	1	0
UNCTAD/Wider c/ (1990)	18	7	3 d/
Page *et al.* (1991)	1	5	2
FAPRI e/ (1993)	4	6	2
Brandao and Goldin (1993)	4	6	4
Goldin *et al.* (1993)	- 2	6	4
Vanzetti *et al.* (1994) f/	10	7	4 g/
FAO (1995)	7	7	4 d/
Goldin and van der Mensbrugghe (1995) h/	1	6	3
B. Real prices in the year 2000 i/			
World Bank (1982)	- 38	- 20	- 32
Zietz and Valdés (1982)	- 20	- 16	- 14
Parikh *et al.* (1986)	1	- 8	10
Roningen *et al.* (1986)	- 7	- 9	- 10
Akiyama and Mitchell (1987)	- 20 j/	- 21	- 24
FAPRI (1991)	- 23	- 15	- 23
Mitchell and Ingco (1992)	- 20	- 18	- 11

Sources: FAO (1994d, p. 25 and 1995, p. 11); GATT (1994, p.62); Anderson and Hayami (1986, p. 57); Valdés and Zietz (1990, p. 46 and 103; and 1994, p.2); Goldin and van der Mensbrugghe (1995, p. 15 and 28); and Vanzetti, Melanie and Barry (1994, pp. 255-256).

a/ Figures in brackets following authors' names refer to the years of publication.
b/ Partial import liberalization in East Asian economies.
c/ Simulated results from UNCTAD and the United nations World Institute for Development Economics Research on the basis of a 20 per cent reduction in producer price support.
d/ Simple average of maize and sorghum price estimates.
e/ Food and Agricultural Policy Research Institute.
f/ Assuming Uruguay Round outcomes for all countries.
g/ Maize only.
h/ Assuming 1991-1993 average protection benchmark and input subsidy reductions as stipulated.
i/ Relative to base year price levels given in brackets; coarse grain prices are simple averages for maize and soya bean price estimates.
j/ Low demand scenario.

38. Generally, therefore, any price changes induced directly by the Uruguay Round Agreements may be less than noticeable against the confluence of diverse price movements associated with constantly changing supplies and demand conditions within the rice economy as a whole. It is indeed noteworthy that the vagaries of climatic conditions simply cannot be assumed away; these exogenous forces have long impacted sharply on market price expectations and outcomes. In recent years, for example, a poor harvest induced the sudden large increase in Japanese rice demand, which then exerted bullish pressures on medium-grain and other rice prices from the last quarter of 1993 up to the first quarter of 1994. Subsequently, however, a moderate rise in long-grain rice prices is expected well into 1995; a smaller, weather-induced crop volume in China and Indonesia and some delayed harvests in Pakistan and Thailand are the causal forces (London Rice Brokers' Association, 1995, p. 1; and United States Department of Agriculture, 1995a, pp. 4 and 20-21).

39. Notwithstanding unpredictable supply shortfalls and other exigencies, a turn-around in the observed secular decline in real rice prices is thus unlikely; the downward trend is quite appreciable, as indicated in the previous section. In this context, opinions are fairly uniform that commodity prices in real terms will continue to fall in the future; the decline is expected to be considerable in the case of rice during the remainder of this decade (table 2). Of course, the simulated results are normally subject to a wide margin of error on the plus or minus side. There are also considerable uncertainties as regards the impact of bio-engineering and new technologies on the rice production frontiers and environment, demand schedules and prices. Nevertheless, the downward trend in real commodity prices, including those of rice, is likely to go on at least within the short to medium run.

2. Transient instability

40. Rice prices have exhibited over the years more pronounced fluctuations than most, if not all, other primary export products, fluctuations which exceed those of the supply changes themselves; the main reasons for these behaviours were discussed previously. By and large, such periodic volatility and inherent sensitivity are not likely to disappear or become more moderate in consequence of the Uruguay Round Agreements. There are several substantive dimensions to this issue.

41. Internally, the current and parallel processes of external trade and domestic economic liberalization will engender an even closer correspondence in short-term movements in local and world rice prices. This will be the more so given the fact that a variety of institutional intermediaries have been abolished or greatly downsized in the process of economic policy reforms and/or due to tightening fiscal constraints in many developing economies (UNCTAD, 1994g, pp. 14-15). Most such intermediate authorities had several major functions, including commodity price stabilization.[6]

42. Intervention was effected between local producer (or import) and consumer (or export) prices by means of variable (and often implicit) levies or budgetary subsidies, supplemented by ancillary stocking and distribution arrangements. These modalities were designed to insulate domestic farmers and their incomes from the full influence of external market forces over the commodity cycles or shocks. There is strong evidence that such price stabilization schemes operated

by 37 developing economies had reduced periodic instability in domestic prices and revenue in the large majority of cases. The stabilization effect was particularly large for grains - with fluctuations in internal prices and earnings being lowered by 15 and 12 per cent respectively over the period 1967-1981. It was positive, even though more modest, in the case of beverages and fibres (World Bank, 1994b, pp. 59-60).

43. *A priori*, it is possible that trade and production liberalization will open up more, as well as enlarge existing, national agricultural markets; these processes can be expected at the same time to induce greater timeliness in domestic supply responses to world price signals. Such interactions could help stabilize global commodity markets and prices through, firstly, a larger volume of traded output (thus making the market less "thin"); secondly, the absorption of unexpected production shortfalls by a greater number of countries (than before); and thirdly, more normal day-to-day transactions by private entrepreneurs (rather than large-scale disposals or purchases which sharply affect prices).

44. However, the outcomes postulated above are unlikely to hold if supply shocks are positively correlated across countries or regions. It is indeed conceivable that, through reform-induced increased elasticity of rice supplies, external prices could become even more unstable than before. This is because timely (and positive) domestic responses from individual countries or markets would collectively magnify or reinforce the perceived or current surpluses or shortages, thus generating correspondingly sharper swings in rice prices at the local and global levels.

45. There is, moreover, another structural and potentially destabilizing factor outside the purview of the Uruguay Round Agreements. Rice is a basic wage good which is of considerable importance in the daily diet and household budgets of the urban and rural poor in particular. Food price stability and security are of significant policy concern, as well as political sensitivity. Given the historical "thinness" in global rice trade and relatively limited rice stocks, any emerging or anticipated output shortfalls would be likely to trigger heavier and more extensive purchases and stocking, contributing thus to greater price instability during the period before the next (presumably enlarged) harvest.

46. The magnitudes of such price volatility depend much on the extent and ownership of rice stocks. Public stock holdings can be expected to be lower as a result of reduced government intervention, and also lower intervention prices, in the post-Round years. As such a withdrawal from intervention is unlikely to be fully compensated for by higher private holdings, the lower total rice stock would tend to raise (or at least would not lower) the variability in rice prices, particularly during shortage periods (Greenfield and Konandreas, 1995b, p.3).

47. As a matter of fact, countries' rice stocks are collectively projected to fall to 13.2-13.6 per cent of total use by the end of the current 1994/95 marketing year; this would be the lowest level since 1974 and some 27 per cent below the stocking volume a decade ago (United States Department of Agriculture, 1995b, p. 37; and World Bank, 1995. p. 17). World rice prices could thus become even more sensitive to marginal changes in output or unexpected delays in the coming harvest in major rice producing and consuming countries, given such a tight stocking situation.

48. The recent steep upswing in rice prices is pertinent in this regard. Due to adverse weather conditions, Japan had to source externally some 2.4 million tons of rice for domestic consumption and stock replenishment purposes during 1993/94. This amount was equivalent to 16 per cent of the world import volume but was less than 0.7 per cent of global output in 1993. Nevertheless, rice prices (5 per cent broken, free-on-board (f.o.b.) ex-Bangkok) jumped by about a quarter in October 1993, as well as in the following month. The increases were less sharp during the first quarter of 1994, but rice prices still remained at a high level during the first half of the year: unit values during this nine-month upswing averaged some 43 per cent higher than those prevailing in 1993. They have, however, moved to a lower level since December 1994, on average (during December 1994 and April 1995) one-fifth lower than the 1994 average level.

49. More generally, a negative shock in the form of a five per cent reduction in total cereal output was simulated by FAO; the objective was to trace whether tariff cuts and other liberalization measures under the Uruguay Round would exert any measurable effects on the stability or otherwise of world cereal prices. A shortfall of this magnitude is a serious matter, but the results as currently modelled indicate almost no impact of trade liberalization on the volatility of prices (FAO, 1995a, p. 23 and 1995b, p. 7).

Chapter III

DEMAND VARIABLES

50. Generally speaking, a noticeable pull on rice prices under the new agricultural trade regime could well come from East and South-East Asia in the short to medium term. Three elements are noteworthy: the removal by Japan and the Republic of Korea of their traditional ban on rice imports, the partial but gradually widening access to their domestic markets, and (by implication) the huge potential for further penetration in these as well as other important sources of rice demand in high-growth economies (e.g. Taiwan Province of China and China).

51. Minimum access concessions made in exchange for delayed tariffication under the Uruguay Round involve a rice import inflow rising from 379,000 tons in 1995 (or four per cent of local consumption) to 758,000 tons in 2000 (or eight per cent) in the case of Japan. The corresponding figures for the Republic of Korea are around 51,000 (or one per cent) in 1995, and about 102,000 and 204,000 in 1999 and 2004 (or two and four per cent) respectively. Additional demand from these two sources in 1995 is thus equivalent to three per cent of the estimated volume of global rice exports during the previous year.

A. Diverse interactions

52. However, the consequent upward pull on rice prices is offset or otherwise modified by two other factors. One, the global export level in 1994 was exceptionally large as a result of the poor cropping season in Japan during 1993, as discussed earlier. The second factor is East Asian preference for Japonica (short to medium grain) rice. Improved access for this variety may thus create some imbalance in the composition of available supplies, with the inevitable spill-over effects on long grain rice prices. There exists, however, another source of demand for Indica rice which has become increasingly manifest. This variety is a daily staple for large immigrant ethnic groups in the European Union and the United States of America, as well as many other developed market economies. As a result, significant amounts of such rice have been imported into the mostly self-sufficient (in aggregate terms) European Union and into the United States, a large surplus rice producer. The inflows of this cereal, which have already exceeded the minimum access threshold as provided under the Uruguay Round in both cases, totalled some 700,000 tons in 1993. They have consisted mainly of fragrant varieties - notably Basmati rice from India and Pakistan, and Jasmine rice from Thailand (see box 3).

53. The upward trend in American rice imports can be expected to continue, as can the large volumes of external sourcing of Indica and aromatic rice varieties among the European Union members or, for that matter, Australia, Canada and New Zealand as well. Apart from the same continuing mismatch between domestic demand and supply patterns, there are also the ongoing demonstration effects of ethnic cuisines. In addition, overall rice consumption per capita remains low though variable in all those countries.[7]

Box 3

Fragrant rice: a source of future export growth

Rice is one of the staple cereals subject to a firm Engel's consumption threshold. But the income elasticities of demand vary considerably among different grades and varieties of rice (box 2). In general, superior quality rice becomes a substitute for its lower-priced counterparts with spreading affluence.

American imports of high-quality rice have risen steadily from around 40,000 tons in 1985 (or just over four per cent of domestic consumption) to some 200,000 in 1993 (or just under 7 per cent); it is estimated that the 1995 import volume will reach a quarter of a million tons. The proportion of fragrant varieties in total rice imports was 83 per cent in 1993, compared to 44 per cent 10 years earlier (United States Department of Agriculture, 1994b, pp. 8-9).

Growth in domestic demand for (long grain) aromatic rice thus has far outpaced that of total rice imports. It has been concentrated on the types of rice not grown in the United States (e.g. Basmati rice from India and Pakistan, and Jasmine rice from Thailand). The country is a substantial surplus producer with some 70 per cent of high-quality long-grain (but non-fragrant) rice in its total output of over six million tons.

Although the volume of rice imported into the European Union was falling by 25 per cent between the early 1980s and 1990s, it remained sizable at 493,000 tons in 1993; this level was equivalent to around one-third of Union consumption (FAO, 1994h, p. 4). Long-grain Indica and fragrant rice constitute the large bulk of such imports into the Union, the proportion being about 90 per cent at present. The largest demand sources for Indica rice are the United Kingdom, France and Germany - with a combined level of almost 80 per cent of aggregate Union consumption of 594,000 tons in 1993/94.

It is significant that such imports have persisted despite relatively very high customs duties and, by implication, retail prices. The tariff on milled rice stood at 387 ECUs, equivalent to US$ 374 a ton in 1992; after peaking at 687 ECUs (US$ 895) a ton in 1987, it fell gradually to about 646 ECUs (US$ 724) per ton in 1993. For comparison, the respective ex-Bangkok f.o.b prices of Thai rice (five per cent broken) were US$ 293, 230 and 264 for the same years.

The declining amount of imported rice during the last decade, noted earlier, was due also to rising internal production assisted by generous subsidies within the European Union. First introduced in the 1987/88 crop season, assistance was set as high as 330 ECUs per hectare; given an estimated yield of 6.2 tons per hectare, this was equivalent to 53 ECUs (US$ 69) per ton compared to an average ex-Bangkok Thai rice price of US$ 230 per ton in 1987. Subsidies declined over time to reach 200 ECUs during the 1992/94 seasons; they were then terminated.

The output responses to such generous incentives were impressive, with output rising from 147,000 tons of paddy in 1988/89 to a peak of 460,000 tons three years later. Spain used to be the largest grower of Indica rice, with 85 per cent of European Union output in 1988/89. The position was recently taken over by Italy, while Greece and France are emerging producers. Production of this rice variety has been on a declining trend within the Union since the early 1990s; preliminary estimates indicate a 1994/95 Indica paddy crop of 370,000 tons (or 259,000 tons of milled rice on the basis of a higher conversion ration of 70 per cent). This is less than half of internal consumption needs at present.

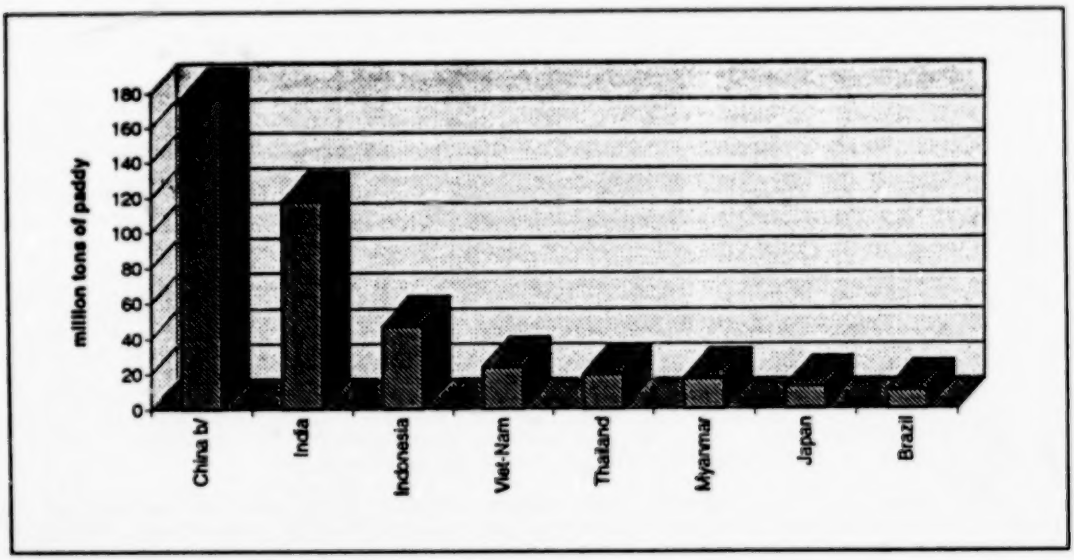
But large sources of demand for better quality rice (whether or not of the fragrant varieties) are not confined just to industrialized countries. There are potentially huge requirements from well-off sections of the rice-consuming population in developing economies themselves. High tariff protection and foreign exchange constraints can slow down but not stop such demand which, in a way, represents an integral part of a rising living standard. In this regard, to provide or to gain access for farm trade consistent with the Uruguay Round Agreements constitutes one of the ongoing challenges of deepening interdependence.

54. A further stimulus relates to lowered import duties: the already small American tariff (US$ 22 per ton on milled rice in 1995) is scheduled under the Uruguay Round to fall by 36 per cent in six years' time. The European Union tariff is set to fall from 650 ECUs (413 for husked brown rice) to 416 (264) ECUs during the same period. More significant, however, are the (implicit) cuts below the bound rates; customs duties on imported Indica (Japonica) rice will not be more than 80 per cent (88 per cent) of the intervention price within the Union.[8]

55. Another factor impinging on the global rice trade in 1994-1995 and perhaps beyond are the output shortfalls caused by unfavourable climatic conditions in China, by far the largest rice producing (and consuming) country, and Indonesia, the third in ranking (figure 4).[9] Preliminary projections of Indonesian net import needs were 725,000 tons in 1994 and over one million tons in the following year; the country's 1993/94 crop was stagnant at the previous year's level, while the 1994/95 harvest was estimated to be about four per cent (or about 1.2 million tons of milled rice) lower. The tentative estimate of demand from Indonesia for 1995 alone is thus substantially larger than the combined minimum market access in East Asia, as noted earlier. However, the rice in demand may be of a different grade and variety.

Figure 4

Output from the world's largest rice producers, 1993-1994 a/
(Million tons of paddy)



Source: FAO (1994g, p. 13).

a/ Data for 1994 are preliminary estimates only.
b/ Including Taiwan Province of China.

B. Overwhelming weights

56. China, not a member of the World Trade Organization (WTO) as yet, has been a net rice importer only twice (1989 and 1995) since 1960; other things being equal and barring further weather-induced damage, the import volume for 1995 is provisionally estimated at over one million tons, a minute amount compared to an estimated consumption level of some 106 million tons in the early 1990s and a target output of 150 million tons in 2000. More significant, however, are the medium- to long-term changes in the supply and demand patterns of this high-performance developing country whose population is forecast to be about 1.3 billion in 2000, an increase of some 100 million from 1993.

57. China's economic growth since the initiation of basic reforms in 1978 has been spectacular - with real GDP expansion averaging 10 per cent annually during the 1980s, compared to 5.5 per cent in the previous decade. Such a steep upward trend is expected to continue: annual growth during the first half of the 1990s averaged 9.7 per cent (UNCTAD, 1994, pp. 442-443; and Asian Development Bank, 1994, p. 231). This enviable record of a sustained increase in per capita income of over eight per cent a year and the consequent structural changes are bound to have a huge impact on world commodity markets in terms of both (initial) scale and rate of progression.

58. Notwithstanding considerable estimation problems, rice consumption per capita in China is believed to have stabilized at some 95 kg per year in the early 1990s; this is by and large comparable to other rice-consuming countries, including Malaysia and Japan. But domestic rice demand will continue to rise for three major reasons. One is natural population growth. Although the estimated rate of 1.2-1.3 per cent is low by other developing countries' standards, such expansion is equivalent to 14-16 million extra persons annually when applied to the massive demographic base. Two, the volume of feed rice requirements would rise substantially to meet the ongoing shift toward greater meat content in the daily diet. Per capita consumption of pork, other meat and fish, among a wide range of agricultural foodstuffs and raw materials, is generally higher in China than in other developing countries as a whole. It is, however, just one-third to one-half of those in the more affluent developing economies - such as Hong Kong, Singapore and Taiwan Province of China (Anderson, 1990, pp. 68-69). In that connection, the available estimates indicate that about seven per cent of China's output of foodgrains were used as animal feeds in 1978, and that share had risen to some 20 per cent by 1990.[10] Third, paddy production in China has exhibited some stagnation in the 1990s, as a result of a confluence of several factors to be examined in the next chapter.

59. Another equally important trend is the gradual but parallel shift in demand in favour of high-quality rice as disposable earnings expand. Increasingly, the premium from selling rice in China's free markets accrues to better quality varieties. This has motivated growers, those in the southern regions in particular, to plant these types of rice despite a productivity some 20-30 per cent lower than their high-yield counterparts (Yap, 1994b, pp. 372-373). Supplies, however, are apparently not adequate, and there has been some reported sourcing not least in 1995 of better-quality Thai rice (100 per cent grade B and 5 per cent broken) from coastal provinces.

60. There is limited scope for the substitution of wheat for rice; apart from consumer preferences, China is already by far the world's largest importer of wheat and related products (some 11 million tons worth almost US$ 1.5 billion on average per year in the early 1990s). Thus, even a marginal increase in internal rice demand of five per cent for food and feed could well be equivalent to at least 5-6 million tons per year. This would generate a massive shock or imbalance in the world rice market - given an aggregate export level of some 14.7 million tons annually during 1992-1994 and the limited prospects for large extra supplies in the short to medium term. Indeed, the confluence of growth and change in China in the longer term could produce an even larger foodgrain shortfall, which could hardly be met by all the currently surplus grain exporters (Brown, 1995, p. 19; and Ryan and Flavin, 1995, p. 120.)

61. India's process of economic growth and restructuring can also exert a potentially phenomenal force on the global commodity markets. Policy reforms in this second most populous country, with about 880 million inhabitants in 1992 and an annual population growth rate of 1.8 per cent, have as yet yielded relatively modest results by dynamic East and South-East Asian standards. Nevertheless, GDP expansion was more than respectable at an average rate of 3.6 per cent a year in 1990-1993. Growth is projected to be higher in the mid 1990s so that the annual increment in per capita income would be in the range of 4-5 per cent (Asian Development Bank, 1994, pp. 231-232).

62. The country is a surplus rice producer at present; net exports averaged less than one per cent of domestic output during 1993-1994, a miniscule ratio common to most rice exporting countries. Per capita consumption of a wide range of food cereals and other farm products is currently very low in India (Anderson, 1990, p. 68-69). Thus, with sustained economic growth, local demand for rice and (notwithstanding a large number of people adhering to a vegetarian diet) meat, fish and other foodstuffs will expand rapidly; this upward trend, also observable in virtually all other fast developing economies as well, has wide-ranging implications for the domestic economy, and for commodity supplies in particular, as well as for policy management for sustainable stability. Some of the issues involved will be explored further in chapter IV.

C. Policy influence

63. Rice demand has apparently stabilized in most major consuming, high-performance economies (e.g. China, Hong Kong, Malaysia, Singapore, Taiwan Province of China and Thailand). In these and other Asian countries, natural population growth (in the range of 1.2 to 2.0 per cent a year) is the main determinant of long-run rice demand, but various shifts in local consumption of high-quality rice are also inevitable. This will provide expanded opportunities for such rice production and trade over time. In the latter connection, the modest liberalization under the Uruguay Round will be helpful, but only as a first initial step toward greater openness and multilateral trade discipline in farm products in the longer run.

64. The requisite cereal imports necessarily depend on the availability of foreign exchange and the opportunities for higher export earnings in most low-income countries in Asia and elsewhere. Self-sufficiency in food staples has long been in a state of precarious balance in many of these countries (more in

the next chapter), and supply responses to meet the expected expansion in rice demand (in terms of both volume and composition) will be heavily conditioned by domestic economic policies and terms of trade.

65. It will be recalled from the discussion in chapter I that African countries as a whole have become the second most important source of rice demand outside Asia. In general, the region can be expected to remain rice-deficit in the foreseeable future. There is, firstly, a comparatively high rate of natural population growth, as well as of rural-urban migration. Population growth is estimated to be upwards of 2.8 per cent annually in sub-Saharan Africa and among the least developed countries in the 1990s, while the urban population is expected to expand by 5.6-5.8 per cent a year in these countries (UNDP, 1994, p. 211).

66. The pattern of urbanization thus tends to favour "convenient" food cereals characterized by less bulk in storage, long storage life, year-round availability in variable volumes as required, less time for preparation, and less energy-intensive cooking and reheating requirements. In addition, per capita rice consumption in Africa is projected to rise to 16 kg a year in 2000, compared to 14 kg in 1988. Experience elsewhere indicates a widespread acceptance of rice in urban areas of island and other economies where roots and tubers used to be the traditional staples, and the substitution has occurred not solely because of favourable relative prices between imported rice and locally produced indigenous subsistence crops.

67. Secondly, the future patterns of rice demand, production and trade in Africa will also depend heavily on the interactive outcomes of a series of structural adjustments and other policy reforms that have been implemented in most regional economies since the 1980s. In varying degrees, for example, rice imports have been liberalized and transferred to the private sector in many countries. In addition, the deregulation of exchange rates and local currency devaluation (by 50 per cent in CFA franc countries in January 1994) have to a considerable extent altered relative prices in favour of domestic rice production and import substitution. The outcomes of policy adjustments and reform process are not entirely clear, however. The growth rates of per capita rice consumption have remained largely unchanged in several African countries; in several others, there has been a certain slowdown, although this is not wholly attributable to rice sector policy reforms themselves (FAO, 1994f, pp. 2-3 and 10-11).

68. Rice imports into developing countries in the Middle East and Latin America are expected to remain high; they are projected to rise by some 4.7-5.4 per cent a year in the 1990s as a whole, compared to 3.5 for Africa (Yap, 1994a, p. 17). This reflects a variety of demand factors. Regarding the former group of countries, there are relatively high growth rates of the immigrant work force from Asia and of the population generally in a large number of these countries. Besides, many of them are, by and large, not constrained so severely in foreign exchange resources; their limited possibilities for increasing domestic rice production can easily be overcome with exports of other products - hydrocarbons and, to some extent, petrochemicals in particular.

69. Most Latin American countries have engaged in significant unilateral trade liberalization as an integral part of their policy reform process, especially since the mid-1980s. The results are generally lower average tariff protection

and much more limited coverage of non-tariff barriers; there are inevitably some exceptions as regards certain individual commodities, but the trend toward more modest tariff levels is relatively uniform (IATRC, 1994, pp. 80-83). The reform process can impact favourably on agricultural output, including that of rice, given an adequate and sustained spill-over of the necessary incentives.

70. Several considerations and issues examined above are, in varying degrees, also applicable to countries of the former Soviet Union and Eastern Europe. These economies are a sizeable source of rice demand and imports; many of them are well endowed with natural resources. Notwithstanding the limited information available, their ongoing reforms of policies and institutions will impact powerfully on the level and structure of domestic output and external trade, including in respect of the rice subsector, in the medium to longer term.

Chapter IV

SUPPLY RESPONSES

71. The overwhelming bulk of global rice output comes from densely populated countries in Asia. Apart from the very high population-to-arable-land ratios, there are also intensive competing demands for farm land, labour and water from various agricultural subsectors and other economic sectors in many of these economies. Rice cultivation is still heavily influenced by the vagaries of weather, while the impetus associated with the green revolutions has apparently been losing steam.

72. Notwithstanding the comparatively smaller base at the initial benchmark year, long-term rice production has been following a downward trend: global output expanded by 3.6 per cent a year between 1965 and 1975; it then declined slightly to 3.2 per cent during the subsequent decade, and it fell appreciably to 1.7 per cent over the period 1985-1993. The implications of a tighter global rice market are sobering. At the microeconomic level, the poor and other disadvantaged social groups (including women, children, the aged and infirm, etc.) tend to bear a proportionately larger share of the burden of adjustments and transition. Low-income, net food importing countries in the third world are also at a considerable disadvantage in a shortage situation; apart from higher cost, the timely availability and distribution of food grant-in-aid cannot always be guaranteed, especially in times of greatest recipient need.

A. Limited land and other resources

73. Under the current circumstances, any large increment in output to meet the expected changes in demand level, as well as the compositional shifts in consumer preferences, would apparently require massive domestic investment supplemented by a variety of ancillary price incentives. There is little scope for more extensive cultivation in the densely populated Asian rice bowl. In particular, as many as eight countries in the region have less than one-half a hectare of land per agricultural worker (FAO, 1986, p. 117). The seven countries with exportable rice surpluses, moreover, have a combined population of almost 47 per cent of the global total but are endowed with less than a quarter of the world's arable land; yet they currently manage to generate almost 38 per cent of global cereal output (table 3).

74. Constraints on land resources are less severe in a few other countries but an expansion of rice land at the margin almost invariably involves a serious trade-off in the form of biomass depletion, deforestation in particular, and substantial outlays in the development of complementary infrastructure. The latter option may not be cost-effective, given numerous other pressing demands on resources in most of these countries. The former would add to the already appreciable strains and stress on the environment in these and other economies as well (Asian Development Bank, 1991, pp. 211-231; Thistlethwait and Votaw, 1992, pp. 177-198; and ESCAP, 1992b).

Table 3

Estimates of population, arable land and cereal production for various developing regions and countries, 1992
(In millions of persons, of hectares, and of tons)

	Population		Arable land a/		Cereal output	
	Number	% of total	Area	% of total	Volume	% of total
Global total	**5480.1**	**100.0**	**1345.9**	**100.0**	**1961.4**	**100.0**
Africa	681.7	12.4	163.6	12.2	84.0	4.3
- Egypt	54.8	1.0	2.2	0.2	14.6	0.7
- Nigeria	115.7	2.1	29.8	2.2	12.5	0.6
Latin America	457.8	8.4	130.1	9.7	111.7	5.7
- Brazil	154.2	2.8	49.5	3.7	44.1	2.2
- Mexico	88.2	1.6	23.1	1.7	27.0	1.4
Asia b/	3233.9	59.0	424.8	31.6	888.2	45.3
- Bangladesh	119.3	2.2	8.8	0.7	28.7	1.5
- China c/	1188.3	21.7	93.0	7.0	400.2	20.4
- India	879.5	16.0	166.1	12.3	201.7	10.3
- Indonesia	191.2	3.5	16.4	1.2	56.2	2.9
- Japan	124.3	2.3	4.1	0.3	14.3	0.7
- Myanmar	43.7	0.8	9.5	0.7	15.3	0.8
- Pakistan	124.8	2.3	20.6	1.5	22.1	1.1
- Philippines	65.2	1.9	5.5	0.4	13.7	0.7
- Thailand	56.1	1.0	17.0	1.3	24.1	1.2
- Viet Nam	69.5	1.3	5.5	0.4	22.3	1.1

Source: FAO (1994a, pp. 3-35 and pp. 65-67).

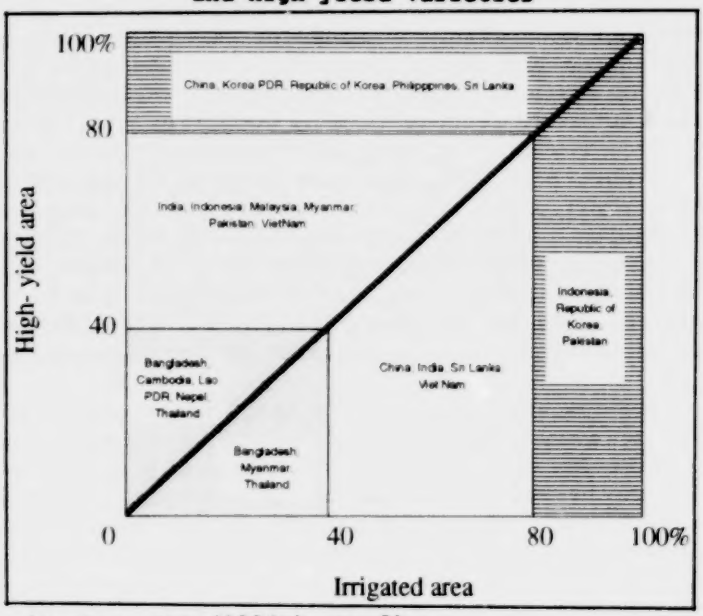
a/ Excluding land under permanent crops.
b/ Including Western Asia but excluding the independent Asian republics of the former Soviet Union.
c/ Including Taiwan Province of China.

75. At the same time, the propelling forces associated with intensive cultivation of rice and wheat through the application of new technologies and modern inputs have lost much momentum in recent decades. On the one hand, such forces have already reached the most progressive and adaptable segments of the farming population in the major producing countries. Many Asian economies, in particular, have more than one-half of the planted area under high-yield rice varieties and irrigation (see figure 5). On the other hand, productivity growth has fallen or stagnated due to the steadily declining quality of the resource base; its sustainability is now a matter of increasing concern.[11]

76. Perhaps another bio-engineering-based "green revolution" (in the truer ecological sense) is needed - especially for non-irrigated rice land and other marginal or uphill areas. Meanwhile, any noticeable leap in rice production and productivity is not likely to be durable without new ancillary requirements. These include innovative directions in agricultural development policies complemented by adequate investment in infrastructure so as to facilitate greater and more equitable access to land-saving technologies and their widespread and effective adaptation and absorption.

Figure 5

Percentage of rice acreage under irrigation and high-yield varieties



Source: Yap (1994a), p. 3).

77. Land shortage problems are compounded by the sizable reallocation of cultivated land in favour of more remunerative cash crops (e.g. vegetables and fruit); to meet urbanization, industrial, recreational and other building needs; as well as for restoration and conservation so as to reduce pollution and better protect the environment. In fact, over the last few decades, conversion to other uses has absorbed about one-half of Japan's grain land; the corresponding ratio is 42 per cent in the Republic of Korea and just over one-third in Taiwan Province of China (Brown, 1995, pp. 17-18).

78. China is inhabited by some 22 per cent of the world's population but has just seven per cent of the global farm land. The country is the world's largest food grain producer, with an output exceeding that of the United States since 1983 (Ryan and Flavin, 1994, p. 119; and United States Department of Agriculture, 1995b, p. 32 and 37). Paddy output in China seems to have fallen slightly from the early 1990s; the 1993 harvest was estimated to be about 6 per cent lower than the (record) 1990 level. Apart from adverse weather conditions, the area planted with rice, peaking at about 33 million hectares in 1990, had been reduced by over seven per cent by 1993. A shift was also observed in favour of, among other crops, higher-quality rice varieties to better match changing preferences. These grains command premium market prices but productivity is some 20-30 per cent lower than high-yield strains (Yap, 1994b, pp. 370-372).

79. There are other major constraints as well. Input costs have generally risen due to lower subsidies and assistance as a result of fiscal resource limitations and/or domestic economic liberalization measures; this has impacted

on incentives through lower returns. The availability of adequate water poses another set of identifiable problems in several countries. In addition, the outflow of rural labour to more rewarding activities or in search of better employment in industry and off-farm has remained heavy; in several high-performance economies, for example, there have been labour shortages during the rice-planting and harvest seasons. At the same time, mechanization has been limited by costs and small rice holdings, while land consolidation is constrained by institutional factors in many countries.

80. Export bans are sometimes imposed to ensure domestic food security and price stability. A temporary restriction was reported to have been imposed on rice exports in May 1995 to conserve internal supplies in China. At the same time, the country is accelerating efforts to disseminate high-yield, high-quality and disease-resistant rice seeds with an expected initial output increase of some 14 million tons in the near term (UNCTAD/WTO International Trade Centre, 1995, p. 2; and United States Department of Agriculture, 1995b, p. 35).

81. The competing demands for farm labour and building land are comparatively strong or even acute among most other high-performance economies in East and South-East Asia. All these forces have combined with higher input costs to render the harvested volumes rather stagnant or slightly lower in several large producers in the early 1990s. Several of them, Malaysia and Taiwan Province of China included, are not encouraging extensive cultivation, while a smaller output is also anticipated in the Republic of Korea due to a shift toward lower-yield traditional varieties enjoying growing demand. Indeed, Taiwan Province of China is likely to become a net rice importer (instead of exporter) through the diversion programme to be in force from 1996; production is expected to drop by about one-third (to around one million tons) toward the end of this century (United States Department of Agriculture, 1994c, p. 12).

82. Through concerted efforts at policy reform, Viet Nam quickly realized a rice surplus in 1989 (box 4). But it is unclear at present whether Myanmar and Viet Nam, two producers which have re-emerged with potential large surpluses, could help sustain the overall historical volume of Asia's rice output under normal weather and other conditions. Indeed, temporary export restraints have been resorted to periodically to ensure improved regional foodgrain supplies and stabilize prices; the latest ones, for example, were imposed by Viet Nam provisionally for two months from May 1995 (UNCTAD/WTO World Trade Centre, 1995, p. 4).

83. Developing countries in Africa and, to a lesser extent, South America face generally fewer barriers as regards land resources for the production of food and other farm products. Through both acreage expansion and productivity increases, rice output is expected to rise rapidly in these two regions. Other things being equal, production growth will result in improved per capita food production in sub-Saharan Africa as a whole; the rate of expansion would be high for Nigeria and Brazil. Africa's production is projected to rise by 4.3 per cent a year to reach some 9 million tons of milled rice by the end of the decade; the corresponding figures are 2.1 per cent and 16.5 million tons in the case of Latin America and the Caribbean. The bulk of output gains are expected to come from Nigeria, where great emphasis is placed on local production, and Brazil due also to favourable resource endowments (Yap, 1994a, pp. 2-5).

Box 4

Economic reform and vent for surplus: the case of rice in Viet Nam a/

Viet Nam, with a population of about 69 million in 1992, is a predominantly agricultural economy. The farm sector absorbs over 70 per cent of the labour force, contributes some two-fifths to GDP, and provides over 30 per cent of the country's foreign exchange earnings. Rice is a predominant staple; it accounts for 85-90 per cent of the food crop area and output, and supplies an estimated three-fifths of per capita food energy intake.

The country used to be an important rice exporter. For a variety of historical and other reasons, production surpluses could not be sustained; Viet Nam has been a large net rice importer for most of the last two decades. As in the case of other economies formerly under a central planning system, the current process of policy reorientation and adjustment in Viet Nam started from the late 1970s. Achievements have been noteworthy, however, considering several daunting dilemmas in macroeconomic stabilization (and the searing transitional costs), as well as the highly limited availability of hard-currency resources and assistance (until 1994).

One of the lynchpins in maintaining realistic relative prices and competitiveness is embodied in a series of exchange rate adjustments. For example, the value of the local currency (relative to that the United States dollar) fell over tenfold between 1987 and August 1989; it was further depreciated another twofold in the early 1990s to restore the eroded comparative advantage caused by high inflation.

Within the agriculture sector, incentive structures were also reformed to raise supply and productivity. Collective farming and official procurement at fixed prices were partially modified in 1981 with a family/household "contractual" responsibility system; notably, small areas of 'rented' land (five per cent) could be worked as private plots, free of land tax and quota obligations.

Output expanded rapidly, by about one-third between the late 1970s and early 1980s; the increases became more modest in the ensuing years as the impact of these partial adjustments lost steam. Generally, the available supplies remained inadequate: rice was needed not only for food but also as a means of (barter) exchange for inputs and (land) tax assessments.

The rice crisis of the mid 1980s, among other factors at the macroeconomic level, induced more wide-ranging policy reforms economy-wide. The introduction in 1988 of long-term land leases (up to 20 years) provided security of tenure. This was then reinforced by deregulation and enhanced private participation in the transport, transfer and marketing of farm inputs and produce (among other commodities and manufactures of domestic or external origin). Largely as a result of this, the efficiency of resource allocation, as well as the satisfaction of pent-up demand, have improved significantly.

Assisted by more realistic exchange rates and good weather conditions, production jumped by over one million tons of paddy (or six per cent) in the following year. Together with the dishoarding of rice (previously stored as a means of exchange), Viet Nam re-emerged in 1989 as the world's third largest rice exporter (of some 1.4 million tons), compared to a large deficit position only the previous year.

(continued)

Box 4 (continued)

The cultivated acreage, yields and production have been increasing since then. Output in 1993/94 was estimated at 23.1 million tons of paddy (despite some weather problems); the planted area in 1992 went up to 6.5 million hectares (or eight per cent above the 1989 surface); it has apparently "plateaued" out in the last two years. Rice exports averaged some 1.8 million tons a year during 1992-1993.

Economic reforms so far have brought performance closer to potential - given the current supplies and state of ancillary resources, infrastructure, and technological capabilities. The tasks ahead are as challenging, if not more so, as are the vastly increased domestic competition for scarce development resources and complexity of policy trade-offs.

Hydrocarbons, rice and frozen sea food are by far the largest sources of exchange earnings. But rice is also the pre-eminent determinant of the real cost of living, and hence of labour productivity and domestic competitiveness, for the foreseeable future. The prevailing dynamism in the rice subsector has to be sustained and, as appropriate, diffused to other agricultural subsectors and utilized to energize the non-farm sectors as well. Given the ever-present resource constraints, the focus of policy support and steerage is likely to be on selected primary subsectoral as well as (non-agriculture) sectoral activities characterized by significant but future gains in economies of scale and scope.b/

Foreign trade and investment (and the associated transfer of technologies and market access) are, by and large, an irreplaceable source of cost discipline and productivity enhancement. The cost-effective utilization of overseas aid for complementary infrastructure and human resource development thus becomes even more crucial for the ongoing process of economic growth and restructuring in at least two self-reinforcing aspects.

One relates to the internalization and multiplication of the benefits and other positive externalities derivable from market-based policy liberalization and competitive globalization; these are to be achieved through the evolving but increasingly synergic harmonization between government provision and private participation. Second, there is also a need to contain and minimize wide-ranging market failures and other imperfections (current or soon to emerge) to ensure more equitable sharing of transitional costs and gains and to protect the ecology and to reverse (if possible) some of the degradations caused to the environmental and resource base, themselves an outcome of largely market-driven excesses.

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a/ The following discussion, in part, is based on FAO (1994e, pp.2-6), United States Department of Agriculture (1994a, pp. 9-11); and ESCAP (1992a, pp. 132-133 and p. 160). See also Lam (1993, pp. 285-306).

b/ Prominent among these activities in the medium term are the processing for export of fishery and aquaculture commodities, horticulture production (e.g. orchids and other cut flowers), poultry and pig products, forestry-based manufactures, and animal feed preparations for purely domestic requirements. The export-oriented manufacturing scenario in Viet Nam is likely to be dominated in the coming decade by the classical trio of standard-technology, labour-intensive assembly of consumer electronic parts, components and products; manufacture of textiles and garments; and footwear and toy production.

84. Generally, however, Africa and Latin America are likely to remain net rice importing regions, and Asia an exporter, for the foreseeable future. The final outcomes in terms of availability and needs at the country level, however, would depend largely on the intricate interactions arising from concerted efforts at domestic policy reform, including production and trade deregulation. These have been implemented by many economies in the three regions as part and parcel of their process of economic growth and structural transformation, as will be discussed below.

B. Agricultural sector restructuring

85. Farming in a large number of developing countries is still taxed by the totality of the policy environment.[12] In addition, the green revolution has yet to run its full course in various regions, and the potential for great leaps in productivity is thus not inconsiderable. Many of the countries concerned, moreover, have a food (or rice) deficit or are precariously balanced in terms of cereal self-sufficiency. The primary issue therefore is to enhance domestic incentives and terms of trade. Such correction of sectoral distortions inevitably also entails ancillary changes in the macroeconomic policy stance - with economy-wide, intersectoral implications on relative price relationships and on the production of tradeable and non-tradeable goods (whether these are primary or industrial in nature).

86. But difficult trade-offs in policy choice are also involved in another context: price incentives alone do not provide a sufficient propelling force forward. Indeed, the single most important factor behind the upward trend in rice yields in Asia, noted previously, is good water control. This is attributable to both an expansion of the irrigation network and improvements in the maintenance of canals, ditches and other water conduits (ESCAP, 1991, pp. 152-153); in turn, it has greatly facilitated the spread of high-yield rice varieties (figure 5 above).

87. The suboptimal use and uneven spread of modern inputs in rice cultivation, as well as other rural activities, has also been the consequence of shortfalls in complementary irrigation, extension services, transport and storage facilities, as well as marketing and credit availability. Virtually without exception, the share of institutional credit to rural areas has been far below the agricultural contribution to total output and employment among third world countries. This has persisted for several decades in spite of the farmer's greater needs for finance due to the seasonal character of agriculture. At the same time, the limited funds available have tended to be channelled towards large rural borrowers and producers.[13]

88. Moreover, technologies oriented largely at a few individual crops (such as rice or wheat) have absorbed most government attention; they have also been disseminated unevenly, and all this is attributable to the ever-present resource constraints. But the lack hitherto of a more broadly based thrust, including the strengthening of peasant and subsistence subsectors, has contributed to some degree of agricultural "dualism" between modern, relatively large-scale and intensive farming and non-irrigated, largely subsistence smallholdings, with implications for subsectoral and regional equity and balance in many developing countries.

89. Another set of issues relates to high-performance developing economies. In varying degrees of gradualness, several of them are losing their comparative advantage in the production of rice and other farm products. Limited arable land and the upward drift in real wages are compounded by emerging shortages of labour supplies and increasing degradation in the resource base. In the case of rice, for example, the eroding advantage can be seen from the prevailing price differentials. Rice from Viet Nam was quoted in April/May 1995 at about 10 per cent lower than the corresponding Thai rice which, in turn, was about eight per cent cheaper than similar American rice. It should be noted, however, that the price gaps vary with market conditions. In early 1994, for example, a ton of five per cent broken rice from Viet Nam was nearly $100 cheaper than the similar Thai grade which was, in turn, over $200 less expensive than the corresponding United States rice; for comparison, rice prices averaged $435 a ton during the first quarter of 1994, a period of steep upswing as a result of large import demand from Japan (United States Department of Agriculture, 1994a, p. 9).

90. The options and problems in restructuring pose formidable challenges to economic management in these dynamic economies. On the one hand, diversification both within agriculture and into non-agriculture activities is needed. But the technical and infrastructure requirements are substantially different from those needed to simply augment the existing cropping base. Nor are they comparable to those needed to spread and strengthen modern practices in regions handicapped by previous neglect or by poorer resource endowments and climatic conditions (e.g. upland and flood-prone areas).

91. On the other hand, the reorientation of national policies to provide suitable incentive structures and ancillary facilities to shift resources away from food grains is an area where experience is rather limited or location-specific. This applies not only to higher-value cash crops, such as fruit and vegetables (whether or not they are off-season or "exotic"); the same is also true for other remunerative activities - including horticulture, aquaculture, livestock husbandry, and dairy farming.

92. The cultivation of high-value rice varieties (e.g. Basmati, Jasmine and specialty rice) deserves greater attention in the ongoing restructuring process - especially in economies where systemic rigidities and other constraints do not permit speedy resource reallocation. These types of rice command a significant premium. The quotations on Basmati rice from Pakistan were as much as 77 per cent higher than those on standard exportable rice (15 per cent broken) during May 1995; they also averaged about 60 per cent higher than the price of high-quality (100 per cent unbroken) Thai rice in the early 1990s. Yet there is ready demand for them in many affluent countries, especially where there are large rice-consuming ethnic groups (see box 3). Such a requirement also comes from better-off sections of the domestic consumers in developing economies, as well as from changing preferences in the course of economic growth. Furthermore, the natural tendency to ensure variety in carbohydrate intake, considerations of health, and a low initial consumption base are other important forces behind the expected expansion in rice demand in more developed countries.

93. The United States produces high-quality long-grain rice but not the fragrant varieties (except for a comparatively negligible amount of Texas-bred and grown crop). The European Union is a surplus producer of high-quality Japonica rice, but to achieve self-sufficiency in (long-grain) Indica rice,

assuming normal yields, would require a much larger planted area in the rice-producing countries/regions of the Union - four times the drought reduced acreage of the 1993/94 season, and 2.5 times that of the 1992/93 harvest. Such an expansion, while not impossible, would mean a devotion to Indica rice varieties of at least one-half of the total cultivated area (FAO, 1994h, pp. 5-7).

94. In the context of meeting the above demand from industrialized countries, more detailed and extensive market surveys are indispensable. Second, there are also a great need for custom-designed packaging. Rice is normally exported in bulk (50 to 100 kilogrammes in a bag) to be milled and/or re-packaged at destination. But for households with rice as a daily staple, smaller lots of 15 to 25 kilogrammes may be less expensive and hence more attractive for marketing purposes; the case for smaller packages made up at source is further strengthened under the new tariff regime with the European Union, as discussed earlier.

95. Thirdly, there may be profitable niches in more sophisticated and innovative preparation and presentation of rice and rice-based products - including partially cooked or ready-to-serve rice and food mixes in individual serving packages or cans, especially for occasional consumers of this cereal in North America, Europe and Australasia. Many of these products may well complement potato chips and other cereal-derived snacks, while ground rice and rice powder can be used more often for mixing, cooking and baking purposes. An outstanding model is the huge (worldwide) success of pre-packaged, ready-to-serve wheat-based noodles originating from East Asia; such an achievement was initially thought to be impossible within a largely rice-consuming continent.

96. But there is another dimension of agricultural sector restructuring which has as yet to be accorded due regard. Resources can be moved across borders, instead of across domestic sectors and subsectors, for restructuring purposes as well. This option is most eloquently typified by the "flying geese" pattern associated with structural changes within the export-oriented industrial and manufacturing sectors in East and South-East Asia.

97. Admittedly, opportunities for foreign direct investment (FDI) in rice production may be highly limited in most developing countries. This is due largely to the particular nature and characteristics of this cereal (an essential food item of appreciable political sensitivity) and of rice cropping (with heavy reliance on large, fixed inputs such as land and labour). These have led to a complex regime of policy intervention in domestic rice production marketing and consumption in many countries (UNCTAD, 1995b).

98. Considerable room, however, may exist for FDI in export-oriented cultivation of high-quality rice varieties and/or in the processing and manufacture of rice-based products; the latter has already taken place in the case of packaged noodles noted earlier. Apart from capital resources, such investment can also bring in valuable new processing and organizational technologies, as well as intimate market knowledge and access. In fact, individual countries' complementarities have been brought to fruition through FDI in many other farm subsectors in Asia and elsewhere, for example in plantation tree crops, aquaculture, horticulture, dairy farming and processing, pig and poultry raising, etc.

99. For all practical purposes, rice farming is likely to remain a largely domestic economic activity in the foreseeable future. Government support appears inevitable; the eroding comparative advantage ushered in by structural change has to be compensated for in the calculus of political economy. This tendency is well evidenced by the development experience in several regions, both developing and developed, and it is unlikely to disappear in the future. In that context, the Uruguay Round Agreements generally can create a differentiated impact on the policy-making environment and reorientating process within the rice and other agricultural sectors and at different stages of development. This issue has different substantive dimensions which have been examined in some detail elsewhere (UNCTAD, 1995a and b).

Chapter V

A CONCLUDING NOTE

100. The objective of the present chapter is to draw out and present some broader perspectives in development that may bear directly on the rice sector and, more generally, the agricultural economy in a global environment characterized by, among other evolving trends, increasing domestic economic liberalization and competitive globalization.

101. The historical confluence of demand and supply patterns holds much promise for exportable rice production. This applies, in particular, to high-quality and aromatic varieties; these have commanded, by and large, a price premium which can be quite significant. They are, in addition, subject to more elastic demand through secular income growth and spreading affluence among rice-consuming developing countries and ethnic groups in industrialized regions. Moreover, the great demand potential among developed countries, where rice is not a daily staple, has yet to be tapped; although comparatively rather low at present, per capita consumption is on a rising trend and can be boosted appreciably upwards through more intensified promotional efforts.

102. The Uruguay Round Agreements can give rise to a more liberalized, transparent, predictable and disciplined environment in world trade in the longer run. Within the foreseeable horizon, however, tariffied barriers against rice imports are likely to remain. As is evident from the discussion in the text, policy and other restrictions can slow down but not shut out completely imported goods. This applies specially to cases where an effective demand for them cannot be satisfied - in terms of quality, quantity and for variety - from (protected or promoted) domestic industries. The existence of large "grey", "parallel" or "underground" markets, including that for rice, in many countries (both developed and developing) is a pertinent case in point.

103. As a whole, global rice supplies have been expanding but at a declining rate, reflecting a variety of constraints on the rice economy. These include the shortage of good arable land in major producing countries, some degradation in the natural resource base through intensive monocropping, rising input costs, and competing demand for land and labour from other agricultural subsectors and economic sectors as well. There have also been noticeable shifts in supply composition to better match changing consumer preferences for superior types of rice; these varieties tend to have lower yields than their "miracle" counterparts.

104. In the above context, a major influence on the global rice market, among many others, is the process of economic growth and structural change in large and fast expanding economies - most notably China, India, and Indonesia. The former two are net rice exporters, as is Indonesia from the mid-1980s. It is conceivable, however, that the inevitable trend toward a greater meat, fish and fruit content in the daily diet could combine with changing preferences in favour of high-quality rice to necessitate external sourcing of rice and other cereals as food and feedstuffs. This would have a huge impact on global commodity markets, given the possible scale of requirements. Whether or not such a

development could reverse the declining trend of rice prices in real terms is not possible to foresee with any certainty at present.

105. A more general, and related, issue is the eroding comparative advantage of agriculture as economies grow and change structurally. Since rice farming will remain basically a domestic economic activity for various structural and policy reasons, the need for commensurate protection and support (of a basically declining sector) will be increasingly felt. The search for less costly and more viable/sustainable modalities for government intervention in agriculture will present a major challenge to economic management; this is all the more true given the new policy-making environment and parameters arising from the Uruguay Round Agreements.

106. In the near term, however, rice output in most producing countries will continue to reflect the vagaries of climatic conditions. This inherent vulnerability, together with the structural "thinness" of the global export market, renders rice prices highly volatile as well as unpredictable. But one of the unintended by-products of the current wave of domestic economic policy liberalization and deregulation has been to shift to rice producers and traders the burden of bearing such price risks. In addition, the ongoing dismantling of government intervention in commodity markets - notably through marketing boards, stabilization funds, and subsidy/processing arrangements - tends to spill over in its impact on the poorer segments of the rural economy, landless agricultural workers in particular.

107. It was noted earlier that there exist modern, market-based financial instruments for the management of price and production risks, among other applications. These can be useful in reducing the amplitudes of fluctuations or otherwise protecting individuals or participating groups, including rice producers, from intra-seasonal price and other risks. Generally, however, the utilization of such management tools within the commodity sector has grown rather slowly among developing economies, due to a variety of circumstances and constraints.[14] Nevertheless, in the absence of alternative arrangements and mechanisms, this is another area deserving commensurate policy attention.

Notes

1. All statistical figures for 1994 are estimates only. Unless otherwise specified, data on China include those for Taiwan Province of China as well. In addition, the rice economy statistics quoted in this paper are largely derived from publications available as of May 1995 from the Food and Agriculture Organization of the United Nations (FAO). The main sources include various issues of the FAO yearbook on production and trade, and of the quarterly bulletin of statistics, as well as several recent sets of papers prepared for the FAO Intergovernmental Group on Rice under the Committee on Commodity Problems and for the International Rice Commission.

2. For a discussion on these issues, as well as on a rice-based model or system of socio-economic development, see Bray (1989, pp. 1-26 and p. 134) and the extensive citations therein. It should be noted here that only the major, most pertinent or representative documents and papers are quoted or referred to directly in the discussion; further references on the subject matter under consideration can be sourced from the comprehensive bibliographies contained in most of these cited pieces of work. This practice is necessary to reduce to a minimum the number of references in, and notes to, the text.

3. Chronic malnutrition is defined in terms of daily calorie intake which is 1.2 times or more below the basic metabolic threshold. This rate of deficiency tends to prevent people from leading a normal life and can result in stunted growth in children. For details of various estimates of poverty, see FAO (1987a, pp. 59-67), World Bank (1986a, and 1990, pp. 27-43), Asian Development Bank (1992, pp. 244-246) and UNDP (1994, pp. 134-135 and 164-165).

4. In fact, global crop failures and supply shortages during 1973-1974 re-energized the search for greater food self-sufficiency and security, particularly among Asian economies. Net cereal imports in South Asia, for example, went up from 2.7 million tons in 1972 to 11.5 million tons during 1975. Despite an overall surplus position in 1971, the Association of South-East Asian Nations (ASEAN) had registered a relatively substantial deficit of 2.8 million tons of grains by 1973. Indonesia was not able to obtain sufficient quantities of rice from either traditional or non-traditional sources of supply to maintain internal price stability during this critical period, notwithstanding the availability of abundant foreign exchange from oil exports for the needed procurement (ESCAP, 1988, pp. 110-111; Sicular 1989, pp. 14-15; and Timmer, 1989, pp. 24-25).

5. These matters, along with other substantive issues, pertaining to rice are examined in some depth in UNCTAD (1995a). For a general and preliminary assessment of the Uruguay Round Agreements, see General Agreement on Tariffs and Trade or GATT (1994) and UNCTAD (1994d and e).

6. It should be noted in this connection that market-based management mechanisms can play a useful role in "smoothing out" seasonal and other price risks associated with commodity trade and, as appropriate, production and development financing. This matter will be discussed further in the last chapter.

7. For the United States, the figures are 6 kg per year in 1978, 8 kg a decade later, and 13 kg in 2000, the corresponding estimates being around 4 kg for the 1980s and 6 kg in 2000 in the case of Western Europe. The projected level of per capita rice consumption in Australia is about 7 kg a year in 2000, from less than 5 kg in 1988 (Yap, 1994a, pp. 16-17).

8. This could mean a greater reduction in the rice import tariff if intervention prices were to decline due to the ongoing reform of the CAP, among other factors. Alternatively, no duty would be paid on those types of rice whose landed cost is greater than the ceiling level, as is likely to be the case with Basmati rice. It follows that the price gap or wedge between this type of rice and other fragrant varieties (e.g. Jasmine rice) could be smaller, with some possible substitution effects. Furthermore, rice processing and packaging at source would be encouraged, as the higher costs incurred could be offset by a lower import duty (FAO, 1994h, p. 5).

9. Provisional estimates of China's and Indonesia's rice imports in 1994 or 1995 can be found in USDA (1995a, pp. 19-20 and 1995b, p. 36). See also FAO (1994g, pp. 13-15) and London Rice Brokers' Association (1995, p.2). However, the extensive flooding suffered by China in early July 1995 may have an impact on the final volume of cereal import requirements.

10. It is worth noting here that, in general, it would require two kilogrammes of grains to produce each kilogramme of poultry meat, four for pork, and seven for feedlot beef (Brown, 1994, p. 17). Moreover, the parallel upward trend in the consumption of certain beverages - for example, beer and grain-based spirits etc. - will also absorb a sizable amount of cereals as input.

11. There is now considerable evidence of adverse influences on the level and stability of yields, as well as other negative externalities, arising from increased cropping intensity and, on the other hand, inappropriate and inadequate translation of modern inputs into outputs. Indeed, a more intensive application of such inputs will yield diminishing returns in several economic and ecological dimensions. See, for example, Byerlee and Siddig (1994, pp. 1354-1359), Yap (1994a, p.8), Asian Development Bank (1991, pp. 217-220).

12. See, for example, World Bank (1986b); FAO (1987b); Aziz (1990); Krueger, Schiff and Valdés (1992); and UNCTAD (1995b).

13. These and other issues associated with the "urban bias" in trade and development policies became a focus of attention in the 1970s, not least through a reflective piece of work by Lipton (1977, especially chapters 3, 6-7 and 11-13). More recent discussion can be found in FAO (1987b, pp. 33-127); Aziz (1990, pp. 13-43); United Nations (1990, pp. 26-46), and World Bank (1994a, pp. 17-42). For a succinct analysis in the context of Asian economies, refer to James, Naya and Meier (1989, pp. 159-166); and Vyas and James (1988, pp. 133-168).

14. At one level, there is a limited awareness of risk exposures and difficulties in identifying and measuring such risks in many developing countries. In addition, the financial policy framework and ancillary regulatory infrastructure required by risk management instruments are not readily in place. Moreover, the lack of a favourable credit rating tends to constrain developing countries' access to international markets. The available instruments, in addition, are normally designed for short-term risk management; they are confined to a small number of commodities as well. At another level, only a small fraction of the potential diversification of risks can be accomplished within the country concerned. But transactions with international financial centres require not only adaptive modifications of domestic institutions and regulations. The rapid pace of technical changes in these centres will also create considerable difficulties for many developing countries' systems to catch up. For a detailed examination of the above issues, see UNCTAD (1993 and 1994f), World Bank (1994b, pp. 61-67), Budd (1995) and Lessard (1995, pp. 115-131).

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